



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,146	11/18/2003	Geun-Hee Cho	8021-180 (SS-18400-US)	5288
22150	7590	06/02/2005	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			NGUYEN, MINH T	
			ART UNIT	PAPER NUMBER
			2816	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/716,146

Applicant(s)

CHO ET AL.

Examiner

Minh Nguyen

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 5-13, 16 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/28/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of group I, species IA (i.e., claims 1-4 and 14-15) in the reply filed on 4/18/05 is acknowledged. The traversal is on the ground that the search and examination of the entire application does not create serious burden for the examiner because subclass 158 and subclass 276 are within subclass 100 even though these groups are distinct. This is not found persuasive because the applicant has not supply evident to prove that with the allowed time by the Office, the examiner could perform a quality searching and examining of the entire application having distinct groups and species.

The requirement is still deemed proper and is therefore made FINAL.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Art Unit: 2816

The abstract of the disclosure is objected to because (i) it is longer than 150 words, (ii) it includes words which can be implied, i.e., “comprises”. Correction is required. See MPEP § 608.01(b).

Drawings

3. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 1 is objected to because of the following informalities: line 11, “predetermined shift signal” should be changed to -- shift signal -- for consistency and for avoiding potential antecedent basis problem, i.e., see line 12, i.e., “the shift signal”. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2816

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 and 14-15 are rejected under 35 U.S.C. 102(e) as being anticipated by US

Patent No. 6,489,823, issued to Iwamoto.

As per claim 1, Iwamoto discloses a delay-locked loop (DLL, figure 21) for receiving an external clock signal (CLK) and synchronizing a phase of a feedback clock signal (RCLK) with a phase of the external clock signal (CLK), the delay-locked loop comprising:

a phase detector (phase comparator 228) for comparing the phase of the external clock signal with the phase of the feedback clock signal (this is a function of a phase comparator in a DLL circuit) and outputting a phase difference as an error control signal (UP/DOWN);

a delay line (the combination of fine delay line 222 and coarse delay line 223), comprising a plurality of delay cells (figure 4 is an example of a delay line with a plurality of delay cells) having various unit time delays (it is clear that the unit time delay in the fine delay cell is smaller than the unit time delay in the coarse delay cell as the names suggested), for receiving the external clock signal (delay line 222 receives the external clock signal CLK), controlling the phase of the external clock signal to obtain an output clock signal (by adjusting the delay time using shift registers 224 and 225) and outputting the output clock signal (ICLK), wherein the number of delay cells in operation is adjusted in response to a shift signal (the shift signal is generated by the corresponding shift register); and

Art Unit: 2816

a filter unit (shift registers 224 and 225) for generating the shift signal for selecting the number of delay cells in operation in the delay line, in response to the error control signal (UP/DOWN).

As per claim 2, the recited limitation is met because the fine delay line 222 receives the clock signal CLK before the coarse delay line 223.

As per claim 14, this claim is rejected for the same reasons noted in claim 1. The recited time delay compensation circuit reads on the DLL, the recited delay unit reads on the combination of fine delay line 222 and coarse delay line 223, the recited control unit reads on the combination of phase comparator 228 and shift registers 224 and 225.

As per claim 15, this claim is rejected for the same reason noted in claim 2.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,292,040, issued to Iwamoto et al. in view of US Patent No. 5,306,971, issued to McCune.

As per claim 1, Iwamoto discloses a delay-locked loop (DLL, figure 17) for receiving an external clock signal (EXTCLK) and synchronizing a phase of a feedback clock signal

Art Unit: 2816

(INTCLK2) with a phase of the external clock signal (EXTCLK), the delay-locked loop comprising:

a phase detector (phase comparator 16) for comparing the phase of the external clock signal with the phase of the feedback clock signal (this is a function of a phase comparator in a DLL circuit) and outputting a phase difference as an error control signal (UP/DOWN);

a delay line (delay line 2), comprising a plurality of delay cells (figure 18) for receiving the external clock signal (EXTCLK), controlling the phase of the external clock signal to obtain an output clock signal (by adjusting the delay time using shift register 4) and outputting the output clock signal (INTCLK1), wherein the number of delay cells in operation is adjusted in response to a shift signal (the shift signal is generated by the shift register 4); and

a filter unit (shift register 4) for generating the shift signal for selecting the number of delay cells in operation in the delay line, in response to the error control signal (UP/DOWN).

Iwamoto does not explicitly disclose the plurality of delay cells in the delay line 2 having various unit time delays as called for in the claim.

McCune explicitly discloses a delay line (figure 1) which comprises a plurality of delay cells G_1, \dots, G_3 wherein the delay cells are structured such that the unit time delay gradually increases from the front end to the rear end of the delay line ($G_1 < G_2 < G_3$, column 3, line 12). He further explicitly discloses that using such a structure of a delay line, very fine resolution in the range of one picosecond or a few picoseconds can be achieved (column 1, line 67-68).

It would have been obvious to one skilled in the art at the time of the invention was made to use the delay line taught by McCune in the Iwamoto's DLL circuit for applications which

Art Unit: 2816

require a precise tuning of the clock signal since the McCune's delay line is capable of allowing very fine resolution adjustments.

As per claim 2, the recited limitation is disclosed in column 3, line 12 of McCune.

As per claim 3, the McCune's delay cell is a differential amplifier (figure 4, column 4, lines 46-47). The resistance value, which is formed by transistor Q3 and resistor R1 in parallel and connected to GND, is adjusted by the collector current of transistor Q1.

As per claim 4, the recited limitation is met because depending on the binary control signals, the collector current of transistor Q1 is changed.

As per claims 14-15, these claims are rejected for the same reasons noted in claims 1-2.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Nguyen whose telephone number is **571-272-1748**. The examiner can normally be reached on Monday, Tuesday, Thursday, Friday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



5/26/05

Minh Nguyen
Primary Examiner
Art Unit 2816